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One More New Species of the Japanese *Tectocepheus* (Acarina, Oribatida)

With 3 Text-figures

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ABSTRACT A new species of *Tectocepheus* is described from Sado Island under the name of *Tectocepheus titanius*. The new species is the largest of all its hitherto known congeners and is mainly caracterized by rostrum, lamella and pteromorpha.

The previous paper (OHKUBO, 1981) gave a detailed description of *Tectocepheus elegans* in order to clarify the complicated taxonomy in the genus *Tectocepheus*. The description of the present new species will give more information on the morphology of the genus.

Tectocepheus titanius sp. nov.

[Japanese name: Ô-kuwagatadani]

(Figs. 1–3)

Dimensions. Body length for 6 specimens: 368(381)289 μ. Width for 5 specimens: 223(234)245 μ.

Rostrum. Rostral appendage never protruding over the outline of rostrum in dorsal view. It consists of a median and a pair of lateral ridges. The median ridge continued from rostral margin. The lateral ridge crooked, extending to the base of cuspis. The median and lateral ridges in this species may correspond to the anterior and lateral walls of rostral appendage, respectively, in *T. elegans*. Rostral margin smoothly rounded between capitular angles.

Lamella. Lamella narrow and short as a whole. Lamellar costa *cla* narrow in most part but widely swelling above bothridium; it reaches the tip of cuspis. Cuspidal costa *ccu* protruding laterad, so that it is observable in dorsal view; it begins from the tip of cuspis. Underside of the latter costa gently curves with rough wrinkles. A deep ditch runs between lamellar and cuspidal costae. Cuspis narrow, tapering toward the tip. The tip without acute processes. Lamellar seta with

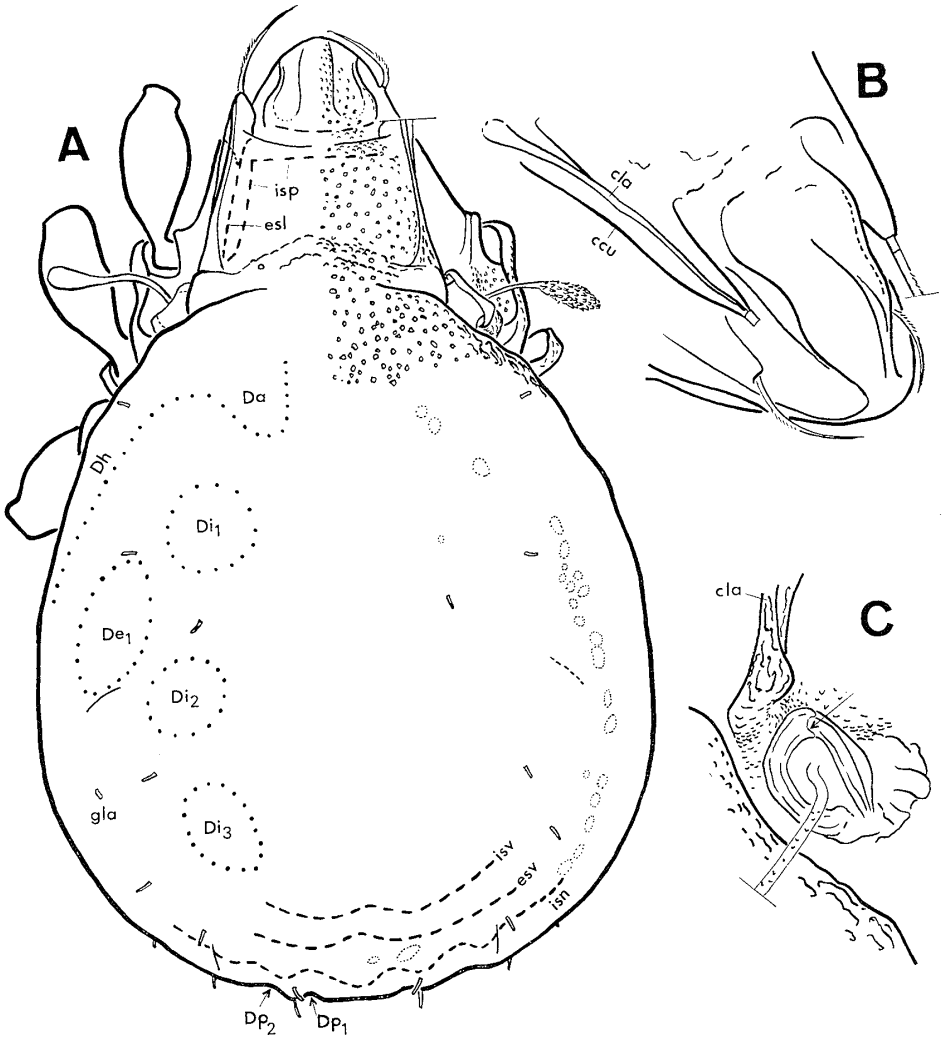

Fig. 1. *Tectocepheus titanius* sp. nov. —— A, Dorsal aspect; B, anterior region of prodorsum; C, right bothridium in dorsolateral view. (esl and esv, external shadows of lamella and ventral plate, respectively; isn, isp and isv, internal shadows of notogaster, prodorsum and ventral plate, respectively).

relatively strong barbs. Its basal part shortly sheathed (Fig. 1 B).

Dorsal side of prodorsum. Transverse cliff (translamella-like structure) nearly straight. The region between two lamellar costae lowered to the level of the upper edge of transverse cliff and almost flat, while a triangular, elevated region extends forward from dorsosejugalis. Medium-sized rounded granules scattered on both the regions. Interlamellar seta short, blunt at the tip, growing on the elevated region.

Bothridium. Though bothridium seems to be retuse in dorsal view at first sight (Fig. 1A, left organ), close examination under incident illumination reveals more complex structure (Fig. 1 A, right organ). In short, it is a trumpet-like tube

of which the exterior border becomes a ringed, wide brim. In dorsal view, the basal tube and upper part of the brim observable. A slit opens between lamella and bothridial brim. The brim nearly round, but interrupted posteriorly. The upper end of the brim at the interruption is truncate, while the lower end is acute. As bothridial brim is anglulated medially (Fig. 1 C, arrow), it seems as if it consists of two parts.

The lateral surface swelling under bothridium. The swelling contains anterior and posterior exobothridial ridges as in *T. elegans*. The former ridge borders the swelling anteriorly. The latter ridge fairly protruding laterad. Exobothridial seta small, bud-like, arising from the anterior slope of the latter ridge.

Head of sensillus dark-colored, with dense, very rough barbs. Peduncle faintly barbed from its base.

Lateral side of prodorsum. Rostral seta arises from a narrow apophysis, having strong barbs. The apophysis becomes a curved ridge which protrudes dorsolaterally to make a pocket. Lower part of anterior carine *ca* strongly ridged, protruding ventrolaterally, so that a groove is formed between anterior carina and genal process.

Tutorium *tu* well developed, protruding dorsolaterally to make a concavity where a part of tibia I is drawn in; upper carina *cs* is an upper edge of tutorium. The surface of the concavity with striations. Lower carina *ci* ridge-like, protruding ventrolaterally to make a concavity where a part of genu I is drawn in. The concavity with small granules. The region between upper and lower carinae almost flat, but slightly concave, having fine wrinkles under incident illumination and obscure network under transparent one.

Lateral side of podosoma. Genal process derived from acetabular tectum. It may be separated into upper and lower parts. The former consists of central and dorsal ridges, while the latter is a ventral fin (Fig. 2 B). The dorsal ridge is an upper border of genal process, covered anteriorly by central ridge and continues to rostral margin. Posterior part of dorsal ridge makes a little concavity on the ventral side. The central ridge thick, becoming a tip of genal process. It makes a large concavity on the ventral side. The ventral fin is a flat plate. Its ventral border forms a part of frame of camerostome, while posterior one is also the border of genal process. Reverse side of the posterior border of the fin deeply excavated.

Acetabulum I bordered anteriorly and dorsally by a well developed ridge or acetabular tectum 1, and covered wholely by pedotectum 1. The pedotectum 1 semicircular, extending to "posterior propodosomal ridge". The posterior propodosomal ridge makes a concavity on the anterior side. Behind the ridge, there is a "podosomal constriction" which may separate propodosoma and metapodosoma.

External border of acetablum II formed anteriorly by acetabular tectum 2 and posteriorly by a ridge which is an external border of internal acetabular orifice. Acetabular tectum 2 is a gentle swelling, continuing to posterior propodosomal

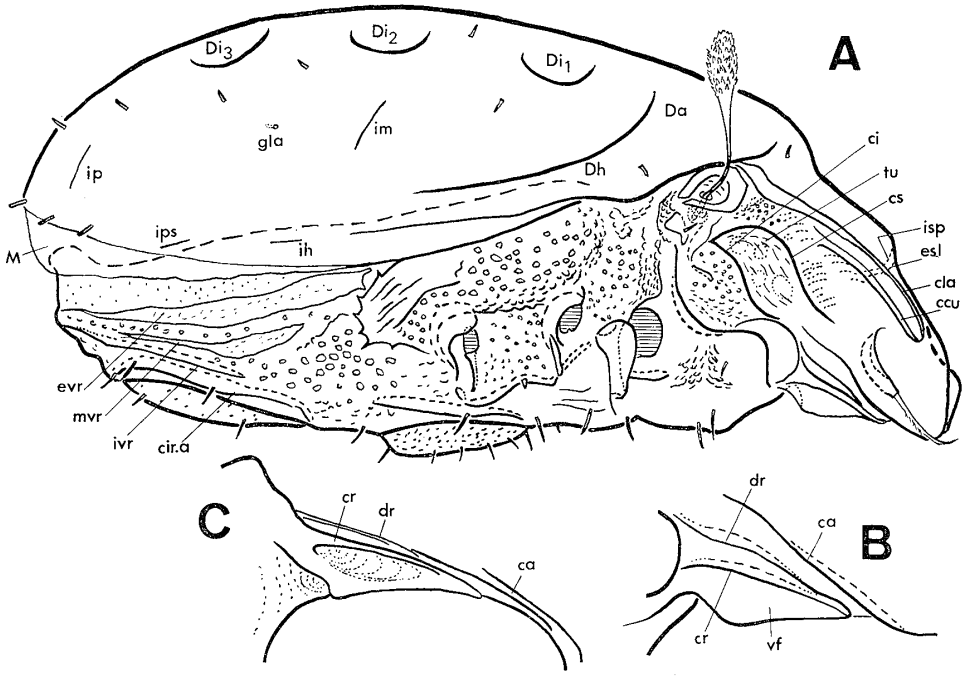

Fig. 2. *Tectocepheus titanius* sp. nov. —— A, Lateral aspect; B and C, genal process in lateral and ventral views. (cir.a, circumanal ridge; cr, central carina; dr, dorsal carina; evr, ivr and uvr, exterior, interior and median ventral ridges, respectively; vf, ventral fin; M, membrane).

ridge. Pedotectum 2 semicircular in lateral view, scarcely covering acetabulum II. A long branch derived from the pedotectum 2, along lower border of acetabulum II. In ventral view, pedotectum 2 curves anterolaterally.

Antiaxial half of internal acetabular orifice of acetabulum III is observable externally if a leg is removed. Acetabular tectum 3 longly developed, extending toward posterior edge of the podosomal constriction. The region between acetabula III and IV with small granules.

Internal acetabular orifice of acetabulum IV is nearly wholely observable if a coxa is removed. Antiaxial condyle of its border well developed as a triangular ridge. Acetabular tectum 4 well developed. Upper metapodosomal ridge is rather an edge where podosoal surface is strongly bent.

Circumpedal ridge very wide, kidney-shaped with fine wrinkles. Its lower border connected to acetabular tectum 4 by a carina. An upper edge free from the body surface, protruding over border of ventral plate.

Epimeral region. The boundary between apodeme and epimeral border difficult to determine from external view. The former is an internal ridge. Such internal structures almost the same as those in *T. elegans*, but border bo_3 more developed.

External surface of epimeral region as follows: The surface slightly concave along border bo_1. Three to four short ridges on border bo_2. A transverse groove

behind border bo_2 wide and fairly deep. Its anterior and posterior edges nearly parallel to each other. Inner ridge of pedotectum 2 not sclerotized. A basin behind border *bo.sj* deep. Plate-like zone with 3 to 5 long ridges. Lower metapodosomal ridge strongly expands laterad. A well developed ridge or "posterior ridge of epimerata" formed near the posterior end of lower metapodosomal ridge.

Epimeral setae longer and thinner than notogastral setae, having pointed tip; seta *4c* exceptionally short and blunt at tip. Setal formula 3–1–2–3. The distance between setae *1a* and *1b* wider than the mutual distance of setae *1a*, and about the same as the mutual distance of setae *2a*. Seta *3b* situated at the exterior border of the plate-like zone. Seta *4c* situated on lower metapodosomal ridge, pointed laterad.

Ano-genital region. Genital aperture relatively large. Genital plates

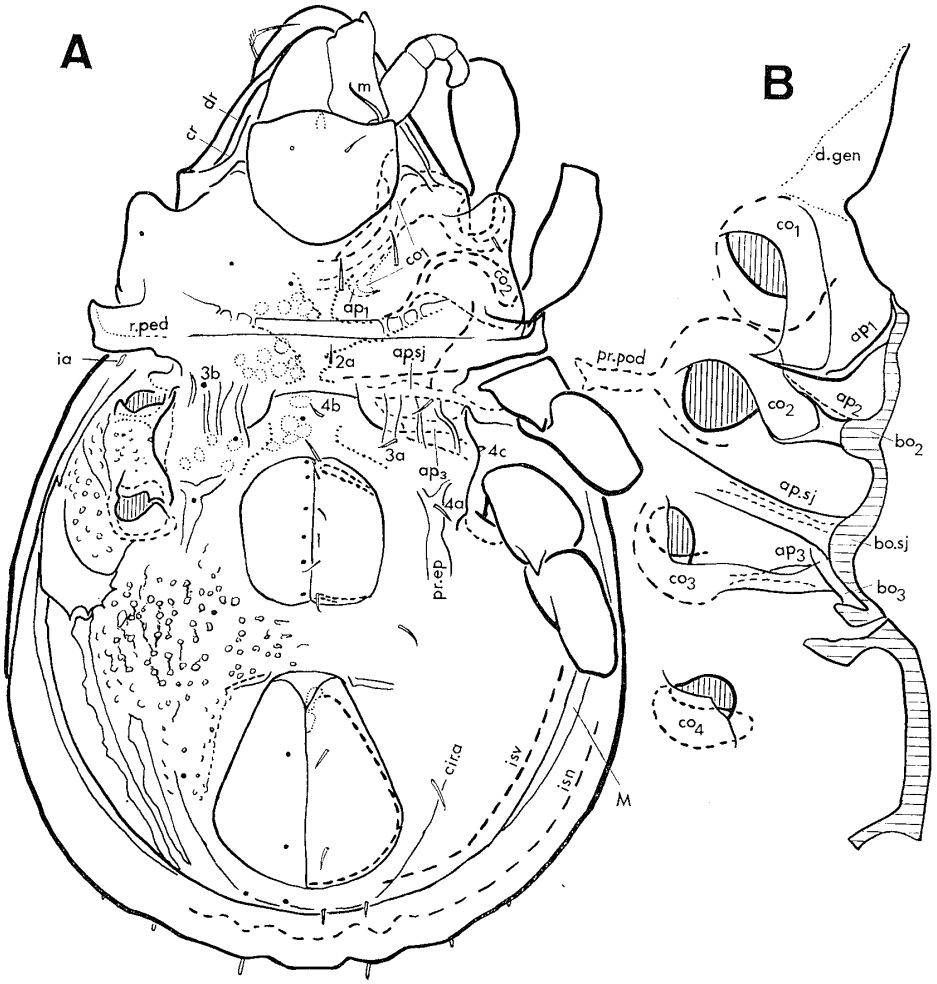

Fig. 3. *Tectocepheus titanius* sp. nov. —— A, Ventral aspect; B, internal aspect of left epimeral region in lateral view. (ap, apodeme; bo, epimeral border; co, cotyloid wall; d. gen, genal process; pr.ep, posterior ridge of epimerata; pr.pod, posterior ridge of propodosoma; r.ped, internal ridge of pedotectum 2).

with dense fine granules. Their lateral margins parallel to each other. Six setae arranged in a straight row just near median margin of a plate. The anteriormost seta slightly longer than the posteriormost one and about 1.5 times as long as the others.

Anal plates faintly granulated. Under transparent illumination, external margin of anal aperture and preanal plate very faint, while internal margin is conspicuous. Anal setae situated relatively near the median margin of anal plate.

Adanal setae situated at a level closer to genital than to anal aperture. The mutual distance of the setae wider than the breadth of genital aperture but narrower than the breadth of anal aperture. Adanal seta ad_3 situated at a level closer to posterior than to anterior end of anal aperture. Seta ad_2 situated nearly at the same level as seta ad_1. The mutual distance of setae ad_3 is about 1.4 times, that of setae ad_2 0.9 times and that of setae ad_1 0.3 times as wide as the breadth of anal aperture.

Adanal fissure linear and long, located almost perpendicular to body axis. The ventral surface behind the fissure abruptly concaved; the concavity exists along the anterolateral border of anal aperture. Adanal fissure is not observable externally as KOSAKU (1980) pointed out in *T. velatus*, because the structure is buried under granules. If granules are exfoliated, the fissure reveals an edged structure (not a crack).

There are many ridges on ventral plate: three pairs of longitudinal ventral ridges and U-shaped circumanal ridge. External ventral ridge is a wide, long plate with sparse granules on its smooth surface, being situated along the lateral ventral border. Median ventral ridge similar to exterior one, but narrower and shorter. Exterior and median ventral ridges parallel to each other. Interior ventral ridge not plate-like, situated along circumanal ridge. Circumanal ridge also not plate-like, relatively high, mounted by adanal setae. Medium-sized granules scattered on anterior part of ventral plate in genito-anal region. Granules not so obscure in front of anal aperture as in *T. elegans*. Small granules scattered posteriorly.

Notogaster. The symbols which were used to describe notogastral hollows and ditches in *T. elegans* are altered in this paper. New ones are as follows: Anterior depression *Da* for *Ha*, humeral one *Dh* for *Hd*, interior ones Di_1, Di_2 and Di_3 for Hi_1, Hi_2 and Hi_3, exterior ones De_1 and De_2 for He_1 and He_2, posterior depression 2 Dp_2 for posterior hollow *Hp*, and a pair of posterior depressions 1 Dp_1 for one posteriormost hollow *Hm*. Notogastral depressions are difficult to observe, as they are very shallow. Depressions *Da*, *Dh* and Di_1 are relatively easy to see. Depressions Di_3 and De_1 only poorly developed. Depression De_2 scarcely developed. Depressions Dp_1 and Dp_2 are rather ditches than hollows.

Humeral process scarcely protruding laterad. Only median projection very slightly developed. Humeral process with wrinkles and granules.

Notogastral setae short and thick with blunt tip, but relatively long for an *Tectocepheus* species. Their positions similar in *T. elegans*, but seta *ms* situated at mid-distance between fissure *im* and seta r_3. Fissure *im* as long as fissure *ip*

and a little longer than fissure *ih*. Fissures *ih* and *ips* subequal in length to each other. Fissure *ih* nearly parallel to lateral notogastral border. Fissure *ips* oblique to the border. Fissure *ip* nearer to body axis than setae r_2 and p_2. Fissure *ia* a little shorter than fissure *ih*, situated on the underside of humeral process, just before the anterior end of the border of notogaster. Grandular opening *gla* like a setal pore externally, when granules are exfoliated. It is elongate internally. Minute grains and medium-sized granules scattered all over the surface.

Mouth parts. Mentum smooth. Median infracapitular seta *m* finely barbed. The anteriormost digit of rutellum relatively long.

Type-series. Holotype (NSMT–Ac 9293, in spirit) and paratopotypes (4 on slides): Aikawa, Sado Island, November 2, 1980, N. OHKUBO, extracted from litter and moss near a mountain stream. All deposited in the collection of the National Science Musium (Nat. Hist.), Tokyo.

Remarks. Among the hitherto known species, *T. concurvatus* KNÜLLE, 1954, *T. knullei* VANĚK, 1960, *T. cervus* BALOGH et MAHUNKA, 1969 and *T. elegans* OHKUBO, 1981 are distinguishable from the present new species by the long, curved cuspis, *T. cuspidentatus* KNÜLLE, 1954, *T. velatus* f. *novus* HAMMER, 1967 and *T. bisignatus* MORITZ, 1968 by the processes at the tip of cuspis, *T. minor* BERLESE, 1903 (BERLESE, 1914), *T. alatus* BERLESE, 1913 and *T. minor* f. *expansus* BERLESE, 1914 by the more developed humeral processes, *T. translamellatus* KNÜLLE, 1954 and *T. coniunctus* KNÜLLE, 1954 by fairly converging lamellae, *T. velatus* (MICHAEL, 1880) by the incised rostral margin, *T. tenuis* KNÜLLE, 1954 by the smaller body size and the more slender cuspis. The new species most closely resembles *T. sarekensis* TRÄGARDH, 1910 sensu KNÜLLE (1954) which has wide to narrow, variable cuspides. The latter is distinguishable from the former by 1) the smaller body size, 2) the slender anal aperture, and 3) the longitudinal patterns in front of dorsosejugalis. The description of *T. vicarius* BALOGH, 1958 is too incomplete, but the species is smaller in body size.

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